

Treatment of Non- Perforating Internal Resorption with Biodentine: A Case Report

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Case Report

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Abstract: This study presents a case of Non- Perforating Internal resorption affecting 35 (FDI) in a 28-year-old male patient, with a history of trauma in that region. Clinical examination revealed that there was a proximal caries in relation to 36. An intra oral periapical radiograph was taken. An oval shaped enlargement of root canal space in relation to 35 was revealed, which was confined within the tooth. The case was diagnosed as Non-perforating internal resorption in relation to 35. Owing to the favourable periodontal condition, orthograde root canal treatment with gutta-percha in the apical portion of the canal followed by filling the resorptive defect with bioactive material Biodentine was recommended as the treatment modality. Root canal treatment was suggested in relation to 36.

Keywords: Biodentine, Guttapercha, Internal Resorption, Trauma, Oval Shaped Enlargement.

INTRODUCTION

Tooth resorption is either physiological or pathological process that is internally (pulpally derived) or externally derived (periodontally derived). The Glossary of the American Association of Endodontists, defines internal root resorption (IRR) as a condition associated with a physiological or pathological process that results in the loss of dentin, cement and bone [1].

The occurrence of internal resorption has been estimated to be between 0.01% and 1%. The condition is more frequently observed in male than female subjects [2].

The IRR could be caused by several stimuli: trauma, chronic inflammation of pulp/periodontal ligament, heat created by the friction of drills during the preparation of cavities, cracked tooth syndrome, tooth preimplantation and orthodontic treatment [3].

Clinically internal resorption may be wrongly identified as invasive cervical resorption which is ruled out by a surface defect while probing the crown. When there is internal resorption, the x-ray shows an enlargement of the root canal, in a manner that the lines which define the walls of the canal disappear. The x ray that identifies the external resorption demonstrates an area of bone rarefaction associated with the dental alteration, while the internal resorption is restricted to the tooth, except when it is communicating the periodontium. That differential diagnosis is important with regard to the clinical behaviour. Radio graphically the lesion presents as a circumscribed; oval enlargement which is uninterrupted with the root canal wall and finally leads to distortion of the canal outline.

One more aspect to be measured in the differential diagnosis is the use of periapical

radiographs in two different angles. The internal defect accompanies the illustration in all of the angulations and the resorption expresses will be likely to stand back from the canal when we change the angle[2].

Once the proper diagnosis is established, treatment must aim at complete removal of the resorptive tissue from the root canal system so as to prevent further loss of hard tissue. This is followed by complete sealing of the resorptive defect. However, selecting suitable restorative materials for these cases remain a challenge[4].

Biodentine is a bioactive material, developed based on the most biocompatible chemistry available for dental materials i.e, calcium silicate which sets in the presence of water. Biodentine attracted attention in the field of dentistry due to its fast setting time, high biocompatibility, high compressive strength, excellent sealing ability, and ease of handling as well as its versatile usage in both endodontic repair and restorative procedures without causing any staining of the treated teeth[5]. This case report describes the 6 month follow

up of internal root resorption in a mandibular second premolar.

CASE REPORT

A 28 year old male patient with non contributory medical history reported to (Meghna Institute of Dental Sciences) the Department Of Conservative Dentistry And Endodontics with a chief complaint of pain in the lower left second premolar since 1 month. The pain was intermittent and aggravated by having cold food and sweets. Pain was reduced by taking NSAIDS and Seratiopeptidases. The patient gave the history of trauma five years back. The patient gave the history of occasional pain and swelling during the whole period.

Clinical examination revealed that tooth number 35 was slightly tender to percussion but showed no abnormal sensitivity to palpation or biting. No sinus tract was found in this quadrant. Also, there was proximal caries in relation to 36. The periodontal condition was normal, with no gingivitis or pocket depths exceeding 3 mm. Vitality tests using EndoIce (Coltene, Switzerland) and warm gutta percha stick, were negative in relation to 35. There was a lingering pain even after the removal of stimulus in relation to 36.

Radiographic findings revealed an oval shaped enlargement of root canal space with a smooth margin, where pulp chamber was more radiolucent than other non-resorptive area of the pulp canal. In the apical area, there was radiolucency and irregular root outline. The defect was found to be confined to the tooth and do not appear to communicate to lateral periodontium using different radiographic angulations. Intra oral periapical radiograph also shows pulpal involvement in relation to 36.

Based on the history, clinical and radiological findings, lesion was diagnosed as chronic periapical abscess with non- perforating internal root resorption in relation to 35 and chronic irreversible pulpitis was diagnosed in relation to 36.

Owing to the favourable periodontal condition, orthograde root canal treatment with gutta-percha in the apical portion of the canal followed by filling the resorptive defect with bioactive material Biodentine was recommended as the treatment modality. Root canal treatment was suggested in relation to 36.

Treatment done

At the first appointment, endodontic therapy was initiated in relation to 35 after local anesthesia administration and isolation with a rubber dam. Pulp extripation was done using small hand K-files and barbed broaches. Working length determination was determined using Root-ZX mini (J. Morita, USA) and confirmed radiographically (Fig-).

After working length determination, the canal was prepared by the crown down method. Master apical file size of ISO 60 was considered. Copious irrigation with accomplished with 3% sodium hypochlorite and normal saline (0.9% w/v). A calcium hydroxide paste dressing was placed to alkalinize the resorbed defect and for the disinfection of the canal. The access cavity was sealed with Cavit.

After 2 weeks, the canal was irrigated with saline to remove the intracanal dressing and is then dried with paper points. There was no bleeding from the canal, indicating that the resorption has not got any external communication.

After the master cone selection, the canal was then obturated with 2% Guttapercha and AH Plus resin sealer using lateral condensation technique (Fig-3). The obturation was done upto coronal third of the root. The gutta-percha was then condensed using slightly heated hand plugger sized RCP 5/7 (GDC, Germany). The filling material was removed apical to the level of the resorptive lesion. The internal portion of resorbed space was filled with Biodentine (Fig-5). Biodentine capsule™ (Septodont, St. Maur-des-Fossis, France) was gently tapped on a hard surface (to diffuse powder), five drops of liquid from a single-dose dispenser were poured into the capsule, after which the latter was placed in a triturator for 30 s. and was firmly condensed into the resorptive defect, aiming to remove air inclusions from the material.

A radiograph taken, showed a satisfactory filling of the entire resorptive defect. Access cavity was sealed with Type IX GIC (GC –High Strength Posterior Restorative)

Single visit endodontic therapy was performed in relation to 36 and the access cavity was sealed with Type IX GIC. Follow up after 3 months and 6 months showed no sensitivity to percussion. Periapical radiograph showed any further progression of the resorption, and no periapical changes were observed. (Fig-1)

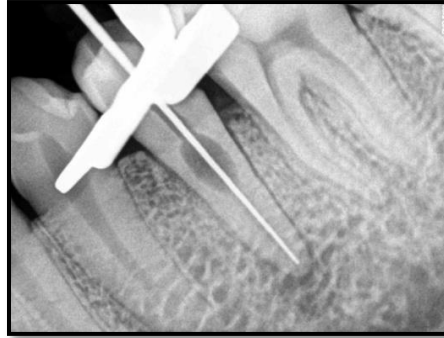


Fig-1: Working length determination in relation to 35



Fig-2: Master cone placement in relation to 35 and Root canal treatment done in relation to 36

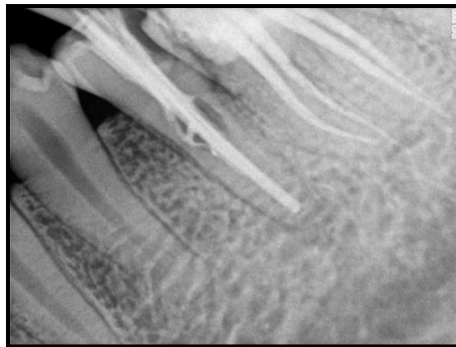


Fig-3: Obturation done by lateral condensation technique

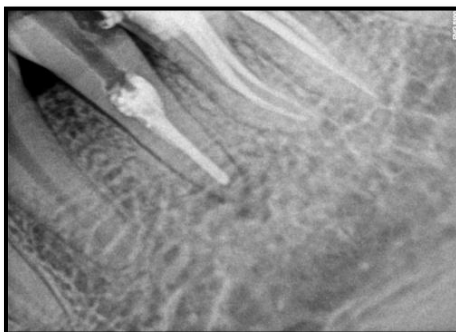


Fig-4: Placement of biodentin in the resorption defect

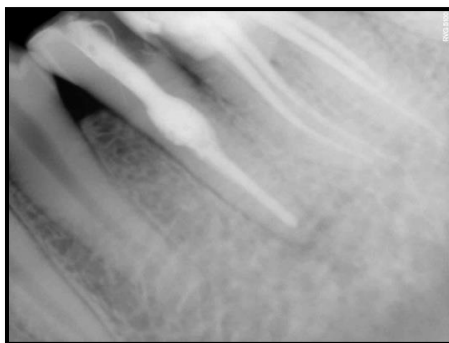


Fig-5: Completely filled root canal in relation to 35

DISCUSSION

Internal inflammatory root resorption is an insidious pathological process that initiates within the pulp space and is associated with loss of dentine [4]. Trauma and chronic pulpal inflammation/infection are the major contributory factors in the initiation of internal resorption [6].

In the cases of tooth trauma, the internal pulpal hemorrhage can develop. Formed blood clots are then replaced by granulation tissue which compresses dentin wall of the pulpal chamber or root canal. The undifferentiated mesenchymal cells of pulp tissue get differentiated into dentinoclasts, which are said to be responsible for resorption of the hard tooth structure [7].

Internal resorption often presents as an oval shaped enlargement of the root canal space and is usually asymptomatic and detected by routine radiographs. When diagnosed, immediate removal of the causative agent must be considered, aiming to arrest the cellular activity responsible for the resorptive activity [4].

In the presence of IRR, pulp necrosis is favorable for the tooth, as long as there is pulp vitality there will be resorption [3]. The endodontic treatment of teeth with internal root resorption is complicated due to the complexity in removing the tissue of the resorption cavity. The endodontic instrumentation of the resorption area can cause communication with the periodontium that could affect the prognosis. However, the soft tissue can be dissolved by the use of sodium hypochlorite in elevated concentrations followed by the use of intracanal medicament. The complicatedness in cleaning the concave resorption area demands a cleaning with chemical substances that have an appropriate organic solvent ability. In this case, along with 3% sodium hypochlorite, calcium hydroxide was placed in the root canal for 2 weeks [2].

The use of calcium hydroxide root canal dressing results in dissolving remaining pulpal debris and alkalinizing the environment. The high alkalinity will inhibit the clastic activity that causes resorption.

The alkaline pH neutralizes lactic acid that is released from the osteoclasts and thus prevents dissolution of the mineral components of dentine. Additionally, alkaline pH activates alkaline phosphatase for tissue formation [7].

The primary aim of root canal treatment is to disinfect the root canal system followed by obturation of the canal with an appropriate root filling material to prevent it from reinfection [8]. Internal root resorption defects can be difficult to obturate sufficiently. In this case, a hybrid technique was used to obturate canals; the canal apical to the resorption defect was obturated with gutta-percha, and the resorption defect was sealed with Biodentine. Biodentine was selected for this case because of its properties like shortened setting time, better handling properties, superior mechanical properties, excellent sealing and antibacterial properties. In previous studies, MTA was used to fill the resorptive defect. However, MTA possesses some disadvantages: a long setting time (2 hours 45 minutes), low compressive strength [5].

CONCLUSION

The prognosis of treating internal root resorption depends on the clinical experience, the structure of the remaining tooth, and the extent of perforation. The dentist needs to determine the treatment that offers the best prognosis based on the diagnosis. With proper treatment and use of modern endodontic techniques and materials, the treatment outcome of internal tooth resorption is expected to be good.

REFERENCES

1. Karanath SAK, Geetha IB, James JM. Management of Internal Resorption- A Catch 22 Situation. *J Oper Dent Endod.* 2017;2(1):31-35
2. Abhishek Parmar, Rakesh Vadher, Girish Parmar, Nupur Dhanak. Management of Internal resorption: Case report. *Indian Journal of Basic and Applied Medical Research.* 2014; 3(4):386-4
3. Maldonado A, Muñoz E. Management of an internal root resorption on a permanent tooth. A case report. *Journal of Oral Research.* 2015 Jul; 10; 4(4):275-81.

4. Jacobovitz M, De Lima RK. Treatment of inflammatory internal root resorption with mineral trioxide aggregate: a case report. *Int Endod J.* 2008 Oct 1; 41(10):905-12.
5. Allazzam SM, Alamoudi NM, El Meligy OA. Clinical applications of Biodentine in pediatric dentistry: a review of literature. *Journal of Oral Hygiene & Health.* 2015 Jun;11:1-6.
6. Nilsson E, Bonte E, Bayet F, Lasfargues JJ. Management of internal root resorption on permanent teeth. *International journal of dentistry.* 2013 Nov; 21.
7. Chowdhury SS, Alam MS. Management of Tooth Resorption by Using Calcium Hydroxide: A Case Report. *Bangabandhu Sheikh Mujib Medical University Journal.* 2012 Jun 29;5(1):72-5.
8. Shanon Patel, Domenico Ricucci,Conor Durak, Franklin Tay. Internal Root Resorption: A Review. *J Endod.* 2010;36:1107–121